

USSR

UDC 519.21

MOSKYIN, D. A., YUDIN, A. A.

"An Analytic Method of Producing Estimates for the Decrease in the Concentration Function of Sums of Independent Random Quantities"

Dch. Zap. Kazn. Un-t, [Scientific Writings of Kazan University], Vol 130, No 3, pp. 41-50, (Translated from Referativnyy Zhurnal Kibernetika, No. 5, 1971, Abstract No. 5Y9 by B. Rogozin).

Translation: For a lattice distribution with maximum probability  $p_1 = \sup_k P\{\xi = kh + a\}$ , an estimate is presented of the maximum probability  $p_n$  of  $n$ -times convolution of the distribution with itself.  $\lim_{n \rightarrow \infty} \sqrt{n} p_n \leq 2\Omega$ , where  $\Omega$  is the solution of the equation  $3 \ln \Omega = (1-p_1)\Omega^2$ . A similar result is presented for the density maximum of  $n$ -times convolution of the distribution with limited density.

Abstractor's Note. The formulation of the results requires clarification. First of all, in estimating  $p_n$ , the quantity  $|\Gamma_2|$  was not considered, furthermore, the equation  $3 \ln \Omega = (1-p_1)\Omega^2$  has two solutions (where  $\Omega \geq 0$ ),

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MOSKVIN, D. A., YUDIN, A. A., Uch. Zap. Kazn. Un-p, Vol 130, No 3, pp. 41-50.

$\Omega_1(p_1) \leq \sqrt{e} \leq \Omega_2(p_1)$  where  $1 - p_1 \leq 3/2e$ ; where  $1 - p_1 > 3/2e$ , this equation has no solutions (where  $\Omega \geq 0$ ). Thus, only where  $1 - p_1 \leq 3/2e$ , and actually  $\lim_{n \rightarrow \infty} \sqrt{n} p_n = 2(\sqrt{e} + 1)$ , where is the greatest root of equation  $3 \ln =$   
 $= (1 - p_1)^2$ . This note relates to estimation of the density maximum. Where

$$1 - p_1 > 3/2e, \lim_{n \rightarrow \infty} \sqrt{n} p_n < 2(\sqrt{e} + 1/\sqrt{e}).$$

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UDC 669.715'725'721(088.8)

3

FRIDLYANDER, I. N., GULIN, A. N., SANDLER, V. S., YATSENKO, K. P., KOLESNIKOVA, V. I., POLYAKOV, YE. S., YUDIN, A. E.

"Deformable Alloy Based on Aluminum"

USSR Author's Certificate No 310946, filed 24 Mar 70, published 1 Oct 71 (from RZh-Metallurgiya, No 4, Apr 72, Abstract No 41627P)

Translation: A deformable alloy based on aluminum is proposed with the following composition: 15-40% Be, 1.5-8% Mg, 0.2-2.5% Li, and Al for the rest. In order to increase the corrosion strength, 0.1-0.6% Si can be introduced into the alloy. In order to increase the strength and plasticity, up to 0.2% Zr, Mn, Cr, and Ti introduced separately or jointly can be added. The proposed alloy permits variation of the properties within broad limits:  $\sigma_B$  40-65 kg/mm<sup>2</sup>,  $\delta$  9-12%,  $\psi$  8-13% (the pressed ingots after quenching and aging). The alloy containing 24.4% Be, 4.3% Mg, 1.9% Li, and the rest Al after heat treatment has  $\gamma$  2.3 g/cm<sup>3</sup>,  $E$  13,650 kg/mm<sup>2</sup>,  $\sigma_B$  59.5 kg/mm<sup>2</sup>,  $\delta$  11.3%,  $\psi$  11.5%. The heat treatment conditions are as follows: quenching from 450°, 40 minutes and aging at 120°, 24 hours. The proposed alloy is obtained by the method of melting and casting in a vacuum and in an inert environment with subsequent deformations. Obtaining the intermediate products is possible by the powder metallurgy methods. The material can

RIDLYANDER, I. N., et al., USSR Author's Certificate No 310946, filed 24 Mar 70, published 1 Oct 71

be used in rigid structural elements in which the defining factors are a combination of lightness, high rigidity with high strength at operating temperatures to 120-150° and under short-term effects, to 400°.

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1/2 049 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--EFFECT OF TECHNOLOGICAL CONDITIONS ON THE PROPERTIES OF A SILVER,  
CADMIUM OXIDE COMPOSITE -U-  
AUTHOR-(103)-YUDIN, B.A., KOLESNIKOV, V.N., BRAGIN, V.P.  
COUNTRY OF INFO--USSR  
SOURCE--POROSHKOVAYA MET., FEB. 1970, (2), 69-76  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR  
TOPIC TAGS--ELECTRON MICROSCOPY, MOLDING MATERIAL, COMPOSITE MATERIAL,  
SILVER, POWDER METALLURGY, PHYSICAL CHEMISTRY PROPERTY, X RAY  
DIFFRACTION ANALYSIS, CARBONATE, CADMIUM COMPOUND, METAL OXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/0125

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CIRC ACCESSION NO--AP0123897

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PROCESSING DATE--13NOV70

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CIRC ACCESSION NO--AP0123897

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. METHODS OF PRODUCING AG AND AG-COO  
MOULDINGS (INTENDED TO SERVE AS ELECTRICAL CONTACTS) BY POWDER  
METALLURGICAL TECHNIQUES ARE DISCUSSED, WITH SPECIAL REF. TO THE  
RELATION BETWEEN THE TECHNOLOGICAL CONDITIONS EMPLOYED IN REDUCING THE  
CONSTITUENTS FROM THE CORRESPONDING CARBONATES AND THE PHYSICAL AND  
CHEMICAL PROPERTIES OF THE FINAL MATERIALS. ELECTRON MICROSCOPE  
EXAMINATION REVEALS A SERIES OF STAGES IN THE REDUCTION OF AG FROM AG  
SUB2 CO SUB3, THE AG PARTICLES MERGING BY A MECHANISM REMINISCENT OF THE  
MOTION OF A LIQUID, WITH BOTH TWO AND THREE DIMENSIONAL DIFFUSION.  
COHERENTLY DIFFUSING AG PARTICLES 0.15  $\mu$ M IN DIA. ARE DETECTED BY X RAY  
DIFFRACTION.

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Acc. Nr.

AP0049304

Abstra  
CHEMIC.

Ref. Code

480226

103090v Cermet contacts of silver-cupric oxide composition.  
Mitskevich, G. F.; Kornienko, V. P.; Namitokov, K. K.;  
~~Smaga, N. N.; Yudin, B. A. (Vses Nauch.-Issled. Proekt.-~~  
~~Konstr. Inst. Elektroapp., USSR). Porosh. Met. 1976, 10(1),~~  
60-5 (Russ). The production of Ag-CuO contacts with fine-  
dispersed structural components is described. Comparative data  
are presented on the properties of contacts produced from a fine-  
dispersed charge, the charge being obtained by chem. methods,  
and contacts from the mixt. of comparatively large-size powders  
obtained by mech. mixing. Comparative results are also given  
for the wear resistance of the contacts during current flow.

S. A. Mersol

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REEL/FRAME

19801121

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USSR

UDC: 621.3.035.2

ZHIBITSKAYA, F. B., and YUDIN, B. G.

"Cooling and Homogenizing Structural Graphite Material in a Special Drum"

Moscow, Tsvetnyye metally, No 3, Mar 72, pp 34-35

Abstract: The Moscow Electrode Plant has designed and adopted for use a new technology of cooling and homogenizing pitch coke material for the purpose of making a product with preassigned properties. The new technique involves the use of drums which are air-cooled by vacuum suction (300 mm Hg) at 15,000 m<sup>3</sup>/hr. For fine-grained pitch coke, the drums are additionally cooled with water. The new equipment makes it possible to cool off the pitch coke within 15-20 mins. from 135-145°C to 95-110°C before press forming. Compared to other equipment, the new technique has reduced press forming waste by 50%, eliminated some of the heavy manual labor in grinding and forming, and improved the sanitary conditions in the shop. (1 illustration)

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YUDIN, B.G.

Structure of,  
Scientific Knowledge.

SO: FOREIGN PRESS DIGEST  
31 Nov 71

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YUDIN, B. G.

"The Concept of Completeness in the Structure of Scientific Knowledge"

Moscow, Voprosy Filosofii, No 12, 1970, pp 81-92

Abstract: Problems related to the principles of the investigation of complete objects are one of the points of intersection of the interests of the concrete sciences and philosophy. The problem of completeness has been broadly discussed in the soviet philosophical and biological literature. In the present article, the author analyzes some problems arising in the process of investigation of complete objects. Primary interest is in the influence of acceptance or rejection of the assumption of completeness on the course of investigation.

USSR

UDC 539.194

GALIMOV, D. G., YUDIN, D. M., and YAFAYEV, N. R.

"The Problem of Iron Coordination in Glasses"

Minsk, Zhurnal Prikladnoy Spektroskopii, Vol 19, No 2 1973, pp 364-366

Abstract: In glasses containing three-valent iron, lines for  $g=4.27$  are observed along with electron paramagnetic resonance lines with  $g=2.00$ . The authors of the present paper offer new data regarding the nature of the center causing the appearance of lines with  $g$  factors of 2.00 and 4.27 which they obtained by studying the tendency of the iron ions to the capture of charge carriers in a gamma radiation field. The measurements were made with the RE-1301 radio spectrometer at room temperature. Electron paramagnetic resonance spectra were obtained under identical conditions from various glass specimens identical in weight and shape. A type K-60000 gamma-ray source with a power output of 300 roentgens/sec, and a maximum dosage of  $10^9$  roentgens was used for the irradiation. The EPR spectra for the various types of glasses are plotted.

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1/2 029  
TITLE--STRUCTURE AND COLOR OF ALUMOCALCIUM TYPES OF GLASS --U-  
AUTHOR--(04)--VEYNBERG, T.I., GALIMOV, D.G., LUNKIN, S.P., YUDIN, D.M.  
COUNTRY OF INFO--USSR  
SOURCE--LENINGRAD, OPTIKO MEKHANICHESKAYA PROMYSHLENNOST', NO 1, 1970, PP  
42-47  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--IR SPECTROSCOPY, GLASS STRUCTURE, ALUMINUM OXIDE, CALCIUM  
GLASS, SILICATE GLASS, PHOSPHATE GLASS, CHROMIUM

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DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1999/1343

STEP NO--UR/0237/70/000/001/0042/0047

CIRC ACCESSION NO--AP0123301

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PROCESSING DATE--13NOV70

2/2 029

CIRC ACCESSION NO--AP0123301

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. INFRARED SPECTROSCOPY, OPTICAL, AND PARAMAGNETIC INDICATOR METHODS ARE USED IN STUDYING THE STRUCTURE OF ALUMOCALCIUM TYPES OF GLASS. IT IS SHOWN THAT THE PRESENCE OF TWO TYPES OF STRUCTURAL UNITS CHARACTERIZE THE INVESTIGATED VITREOUS MATRIX: (ALO SUB) AND (ALO SUB6). ON THE BASIS OF RESULTS OBTAINED FROM STUDYING THE ABSORPTION SPECTRA OF ALUMOCALCIUM TYPES OF GLASS COLORED BY IONS OF RARE EARTH METALS AND VARIABLE VALENCY METALS, IT IS SHOWN THAT THE DEGREE OF COVALENCY OF THE CHEMICAL ACTIVATOR LIGAND BONDS AND FIELD FORCE ARE HIGHER FOR ALUMOCALCIUM TYPES OF GLASS THAN THEY ARE IN SILICATE AND PHOSPHATE GLASS. NEW VALENCE STATES ARE OBTAINED AND STUDIED FOR CHROMIUM (TETRAVALENT AND PENTAVALENT CHROMIUM).

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Ref. Code: 4A 0000

Meshcherskaya, A. V.; Rukhovets, L. V.; Yudin, M. I.; Yakovleva, N. I.

Natural Components of Meteorological Fields (Yestestvennyye sostavlyayushchiye meteorologicheskikh poley) Leningrad, Gidrometeoizdat, 1970, 199 pp (SL:2015)

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Acc. Nr.: AM 0105455

In the monograph main results of a statistical analysis of meteorological elements with the aid of the methods of expansion in natural orthogonal functions are generalized.

A brief survey of modern works is given, in which the method of natural orthogonal functions was used. Much of the paper deals with the presentation of original studies of many meteorological elements with an analysis of their horizontal, vertical and temporal distribution. Discussion is given of this method as applied to a number of practical problems in meteorology and climatology, including the problems of hydrodynamical and statistical weather forecast.

As an enclosure to the monograph, one can find *The Atlas of Maps of Dispersions, Mean Values and Most Significant Natural Components of Basic Meteorological Elements*. Such an Atlas is published for the first time. It gives an idea of forms of variations in the atmosphere, their seasonal differences and other peculiarities of large-scale regularities.

The monograph and the Atlas could be used by specialists in the field of climatology, synoptical meteorology, aerology, and adjacent subjects, as well as by students who are interested in using the modern statistical methods in natural sciences.

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REEL/FRAME

19880445

YUDIN, F. P.

ATOMIC  
ENERGY

YUDIN, F. P.

EXPERIENCE IN BURIAL OF LIQUID RADIOACTIVE  
WASTES IN DEEP GEOLOGICAL FORMATIONS

Article 14

[Article by F. P. Yudin, M. S. Ponomarev, A. I. Ivanov, S. I. Lashin, V. I. Sedov, V. I. Sedov, Moscow, Atomic Energy, Atomic Energy, Moscow, Vol. 25, No. 2, August 1968, pp. 128-131]

The basic studies in the field of the burial of radioactive wastes are directed toward the development of a technically simple and economic method of the removal and burial of wastes [1-5].

One of the promising techniques is the burial of the liquid radioactive wastes in the abyssal geological formations. In the Scientific Research Institute of Atomic Reactors (SRIAR), studies have been conducted on the possibility and the conditions of the burial of wastes in the deep layers of the earth. Certain results of the investigations have been discussed in the reports [6-8].

In 1965, on the basis of the available data on the study of the geology of the region, it was recognized as possible and feasible to proceed to the construction of an experimental facility at the site of the removal of radioactive wastes into the Earth's interior for purposes of accumulating practical data for the construction of a commercial installation. The main for the test facility envisioned the maximal utilization of the structures of the existing existing station on the decontamination of the wastes by evaporation, and the maximal use of the already-existing geological-prospecting boreholes.

Results of the Geologic-Hydrogeological Investigations

The region under study in the regional plan pertains to the Arslan Platform. For a detailed study of the geological section and of the tectonic levels, we drilled three holes. These boreholes exposed a layer of the base-Cenozoic and Paleozoic sedimentary deposits with a total depth of 2270-2300 meters, occurring in the crystalline base of the Arslan age.

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[I - USSR - E, 2]

UDC 621.039.714

26 September 1968

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YUDIN, F.P.

# DISPOSAL OF RADIOACTIVE WASTES

DP RS 58764  
17 April 1973

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Collection of papers sponsored by the State Committee for the  
Use of Atomic Energy of the USSR, 1972, Moscow

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Technical-Economic Comparison of the Methods of Solidification and Tank Storage for Highly Active Liquid Wastes from the Processing of Spent Fuel Elements of Water-Cooled Water-Moderated Power Reactors (L. G. Azamuyeva, et al.) .....	36
Scientific Prearrangements for Burying Highly Active Liquid Wastes in Deep Geological Formations (V. I. Spitsyn, et al.) .....	47
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[I - USSR - K]



SCIENTIFIC PREREQUISITES FOR BURYING HIGHLY ACTIVE LIQUID WASTES IN DEEP  
GEOLOGICAL FORMATIONS

(Paper by V. I. Spitsyn, V. D. Balukova, F. P. Yudin, and M. K. Plimnov,  
State Committee for the Use of Atomic Energy of the USSR; IAEA publication  
SM-163/40, Moscow, 1972)

In the USSR storage spaces have been created for liquid wastes of intermediate and low radioactivity in deep aquifers of the Earth, composed of jointed and porous rock, reliably isolated by water-tight clay layers (1, 2, 3).

The storage areas in operation are engineering structures, the basis of which is found in definite hydrodynamic schemes, constructively outfitted wells and apparatus making it possible to regulate the filling of the storage space and to monitor the state of the wastes taken into it.

A complex of scientific research work performed and the results of the operation of such storage spaces at the present time make it possible to make a definite evaluation of the possibility of such burial for highly active liquid. It is necessary to comment that with the removal of liquid highly active wastes into a geological medium it is not their simple discharge into some formation or other that is considered, but the creation of a storage area of definite dimensions and operating regime with a series of devices controlling its operations: wells, special plants, and instruments.

The introduction of highly active liquid wastes, which are, as a rule, nitric acid solutions in which corrosion products and a considerable quantity of soluble salts (such as nitric acid salt, for example) are contained, into underground strata is accompanied by a number of physico-chemical processes, which may cause undesirable consequences.

This communication is devoted to the basic physico-chemical factors determining the operation of underground storage areas for the type of wastes under consideration.

# 1. Chemical Effect

The collector strata, with respect to their characteristics, differ basically from the physico-chemical system of the highly active discharge and all chemical reactions in the reaction of such systems are directed toward geochemical equilibria of the strata. However, in this case essential changes occur both in the composition of the waste and in the system of strata.

The basic changes in the solid phase of the strata are associated with the effects of hydrogen ions and with the salinization of the surfacelayers of the rock particles. The effects of the acid, in the final analysis, turn out to be most effective. A decrease in the dimensions of a mechanical composition of the rock. A decrease in the dimensions of the coarse particles and solution of the fine particles occurs, which for aluminosilicate rocks with an effective porosity of the strata of 8-12%, may cause destruction of 30-35% of the solid phase.

In a moderate effect of acid no failure of the skeleton of the rock occurs, but the ion-exchange capability of the rocks for radioisotopes decreases sharply.

For carbonate rocks failure occurs, practically completely, with possible gas formation.

The reaction of the liquid phase is also associated mainly with the change in the acidity and as a function of the composition of the ground waters, is accompanied by: for carbonate and bicarbonate waters, their decomposition; for chloride waters, a sharp increase of their chemical activity.

The decrease in the acidity of the waste occurring causes hydrolysis of the corrosion products contained in the waste water, and also secondary sediment formation due to the dissolved components of the rocks, i.e., the stability of the liquid phase is disrupted, and a deposition of sediments in the threshold space occurs. In this case, the distribution of sediments in between the phases varies sharply and the processes of heat and gas liberation become uncontrolled factors, which in the burial of highly active wastes is intolerable.

Thus, the first requirement for the accomplishment of the burial of highly active liquids is the provision of their compatibility with the stratum material and the preservation of homogeneity of the liquid phase. The solution of such a problem may be performed by two methods: special preparation of the waste or preliminary preparation of the stratum.

USSR :

YARIMPIL, B., Candidate of Veterinary Sciences, and YUDIN, G.A., Candidate of Veterinary Sciences, Scientific Research Institute of Animals Husbandry, Mongolian People's Republic, and All Union Institute of Experimental Veterinary Medicine

"Diagnosis of Horse Glanders"

Moscow, Veterinariya, No 6, Jun 71, pp 110-112

Abstract: Intracutaneous injection of mallein is superior to the conventional double ophthalmic mallein test for diagnosis of horse glanders. It has been used in Mongolia since 1954. In 1967 both tests were compared in a study of 666 horses at three different farms and one leasing enterprise. It was found that the intracutaneous test yield a positive reaction in 1.8 times more horses than did the ophthalmic test. It was found that the character of intracutaneous allergic reactions depends on the season of the year and the degree to which the animals are nourished. In spring, when the animals are not as fat, the reaction takes longer to appear (from 36 to 48 hours) and disappears within 24-48 hours; also, the reaction is less sharply pronounced. In another test with 1,495 horses, single and double applications of intracutaneous mallein were compared. It was found that, in general, the allergic reactions were

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USSR:

YARIMPIL, B., et al., Veterinariya, No 6, Jun 71, pp 110-112

more pronounced the second time and 2.3 times more animals exhibited a positive reaction. In a third test series, the appearance of complement-fixing substances in horse blood was studied after intracutaneous introduction of mallein. No complement-fixing substances were detected in the blood of healthy horses after introduction of mallein. Therefore the method does not interfere with subsequent serological studies of glanders.

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USSR

UDC 621.791.753.9

TKACHEV, V. N., Doctor of Technical Sciences, YUDIN, I. YE.,  
Engineer, KAGAN, I. L., Engineer, MERKULOV, B. A., Engineer,  
Rostov Scientific Research Institute of Machinery-Manufacturing  
Technology

"Welding in Carbon Dioxide With Sv-08 Wire Coated With Aluminum  
Alloy"

Moscow, Svarochnoye Proizvodstvo, No 3, Mar 72, pp 20-22

Abstract: Results are presented of an experimental investigation  
in welding low-carbon steels in carbon dioxide with Sv-08 wire,  
1.6 mm in diameter, coated with aluminum alloy of the composition  
(in %): 0.52 Mn, 8.18 Si, 1.81 Cu, 0.45 Mg, and 0.24 Zn. The  
welding process with alitized low-carbon wire in carbon dioxide  
is characterized by high stability of arc burning. The metal  
transfer within the 90-170 A/mm<sup>2</sup> current density range was found  
to be large. The microstructure of the beaded metal is shown.  
The mechanical properties and hardness distribution in welds by  
one- and multi-operation-welding are discussed by reference to  
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TKACHEV, V. N., et al, Svarochnoye Proizvodstvo, No 3, Mar 72,  
pp 20-22

tabulated data and diagrams. The mechanical properties of the  
welded-on metal were found to be identical to properties of the  
metal beaded with Sv-08GS and Sv-08G2S wires. 2 illustrations,  
2 tables, 3 bibliographic references

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UDC 62.841

YUDIN, K. M.

"Dynamics of Joint Operation of a Thermal Engine and a Generator Used for Starting Gas Turbine Aircraft Engines"

"Elektromashinostr. i elektrooborudovaniye. Resp. mezhved. temat. nauch.-tekhn. sb." (Electrical Machinery Building and Electrical Equipment. Republican, Interdepartmental, Thematic Scientific Technical Collection of Articles) 1971, No 10, pp 28-32 (from Referativnyy Zhurnal-Aviatsionnyye i Raketnyye Dvigateli No 10, Oct 71, Abstract 10.34.100)

Abstract: Dynamics regimes of joint operation of a thermal engine and a generator are considered. Methods for determining the indicated regimes are outlined, conditions of reliable operation of an airfield electrical power unit during start of powerful gas turbine (AI-20) aircraft engines are determined. The results obtained made it possible to synthesize a system of automatic control for a new airfield APA-4 electrical power unit. 5 figures, 4 references.

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USSR

UDC 541.12:542.61:541.6:547.1'118

KABACHNIK, M. I., LASKORIN, B. N., BERTINA, L. E., MEYER, T. YA., KOSSYKH, V. G., YUDIN, K. S., BERMAN, Z. A., and NEPRYAKHIN, A. M., Institute of Hetero-Organic Compounds, USSR Academy of Sciences

"Dependence of the Extraction Ability of the Dioxides of Tetraarylmethylene Diphosphines Upon Their Structure"

Moscow, Izvestiya Akad. Nauk SSSR, Soriya Khimicheskaya, No 1, Jan 72, pp 65-70

Abstract: The connection between extraction ability and structure is currently being widely studied, but so far only in the case of monodentate neutral organophosphorus compounds; the corresponding bidentate compounds, with two phosphoryl groups in the molecule, have gone completely unstudied.

Using the extractant dilution method, the authors determined the composition of the extracting complexes of uranyl nitrate with dioxides of the tetraarylmethylene diphosphines containing various substitutes in the meta- and para-positions of the phenyl rings. Effective extraction constants of uranyl nitrate for a series of tetra-substituted dioxides of the methylene-diphosphines were computed. Effective extraction constants for complexes with three molecules of the extractant were found to correlate well with the Hammett constant, and with the  $\sigma^{-1}$  constant -- something not observed in the case of  $1/2$

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CHNIK, M. I., et al., Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya,  
1, Jan 72, pp 65-70

complexes with two molecules of the dioxide. Finally, the connection between the extraction ability of the diphosphines and their alkalinity was found to be a linear one. Various tables and graphs are included in the paper.

USSR

UDJ 621.372.8

KORENEV, I.L., YUDIN, L.A.

"Radiation Instability Of Electron Rings In A Waveguide"

Izv.VUZ:Radiofizika, Vol XV, No 2, Feb 1972, pp 272-282

Abstract: The stability of the oscillations is considered of an infinitesimally thin electron ring in a cylindrical metal waveguide, the generatrix of which is parallel with the axis of the ring, and which has ideally conducting walls. The azimuthal and transverse oscillations of the ring are studied. Expressions are found for the increments of unstable harmonics in the vicinity of waveguide resonances. The results are presented of numerical calculations of the increments. The authors are deeply appreciative to M.L. Levin for helpful discussions and great attention to the work. 5 fig. 6 ref. Received by editors, 27 Apr 1971.

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USSR

UIC 621.372.8

KORENEV, I. L., YUDIN, L. A.

"Radiation Instability of Electron Rings in a Wave Guide"

Gor'kiy, Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, Vol XV, No 2, 1972, pp 272-282

Abstract: The stability of the oscillations of an electron ring inside a metal tube with ideally conducting walls -- a cylindrical wave guide the generatrix of which is parallel to the ring axis -- was investigated. Expressions were obtained for the unstable harmonic increments. A study was made of the instability in the vicinity of the wave guide resonances. Some numerical results of calculating the increments are presented, and analysis of them shows that the radiation increments of the azimuthal oscillations always significantly exceed the increments of the transverse oscillations. Special attention is given to the ultrarelativistic case in the study.

- END -

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CSO: 1860-W

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--RENDOGRAPHY AS A METHOD OF EARLY DIAGNOSIS OF PRECLINICAL FORMS OF  
RENAL ANGIOPATHIES IN PATIENTS WITH DIABETES MELLITUS --U-  
AUTHOR--(03)--OGANESOVA, V.T., LYASHKO, K.YA., YUDIN, L.A.

COUNTRY OF INFO--USSR

SOURCE--TERAPEVTICHESKIY ARKHIV, 1970, VOL 42, NR 6, PP 75-77

DATE PUBLISHED-----70

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TOPIC TAGS--DIAGNOSTIC METHODS, DIABETES MELLITUS, KIDNEY, RADIOSOTOPE

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0129259

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE METHOD OF RADIOISOTOPE RENOGGRAPHY WAS USED FOR INVESTIGATING PATIENTS WITH DIABETES MELLITUS TO REVEAL EARLY PRECLINICAL FORMS OF RENAL AFFECTION. A TOTAL OF 50 PATIENTS WITH DIFFERENT DEGREE OF THE DISEASE SEVERITY (MILD, MODERATE, ACUTE) INCLUDING 22 PERSONS WITHOUT ANY CLINICAL SYMPTOMS OF RENAL AFFECTION WERE EXAMINED. IT WAS ESTABLISHED THAT RENOGGRAPHY IS OF DIAGNOSTIC VALUE WHEN USED IN COMBINATION WITH OTHER METHODS OF INVESTIGATION AND WHEN ACCURATELY DONE CAN BE USED FOR EARLY DIAGNOSIS OF PRECLINICAL FORMS OF RENAL AFFECTION IN DIABETES MELLITUS. FACILITY: KAFEDRA GOSPITAL'NOY TERAPII I KAFEDRA RADIOLOGII I RENTGENOLOGII, I MOSKOVSKOGO MEDITSINSKOGO INSTITUTA IM. I. M. SECHENOVA.

UNCLASSIFIED

USSR

UDC 547.757'759.3:542.958.1:543.544

YIDIN, L. G., PAVLYUCHENKO, A. I., BUDYLIN, V. A., MINKIN, V. I., and KOST, A. N., Moscow State University imeni M. V. Lomonosov, and Rostov State University at Rostov-na-Donu

"Indole Chemistry. XXI. Nitration of 3-Acylindoles"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 11, Nov 71, pp 1506-1511

Abstract: In nitration of 3-acyl- and 3-carbetoxindoles with various nitrating agents, relative prominence of hydrogen atom substitution in position 4, and replacement of the acyl radical by a nitro group in position 3, very largely depends on the immediate conditions of the experiment. Here the authors compare available experimental data with reactivity figures obtained with use of the LCAO-MO method (linear combination of atomic and molecular orbits). It is concluded that hydrogen atom substitution in the benzene ring of the models studied represents an electrolytic attack on the unprotonized molecule of the indole compound.

USSR

UDC 547.752'254.9:542.957.1

YUDIN, L. G., KOST, A. N., and PAVLYUCHENKO, A. I., Moscow State University  
Institute of Chemistry of the USSR Academy of Sciences

"Indole Chemistry. XXVI. Mercurization of the 1-Methylindoles"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 11, Nov 71, pp 1517-1521

Abstract: Among the reactions of electrophilic substitution in indoles, mercurization has been very little studied, owing, probably, to the infusibility and insolubility of many of the polymerization products. The authors avoided this difficulty by the use of 1-methyl-3-iodo-2-chloromercurindole, which has a definite melting point, as well as the usual properties of the arylmercurichlorides. Some physico-chemical properties, and also compositions and empirical formulas of eight mercurized indoles, and of six derivatives of mercury diindolyl, were determined. It was found that hydrogen atom of 1-methylindoles is mercury-substituted in position 3, if that position is occupied -- otherwise in position 2. The 2- and 3-chloromercurindoles are readily symmetrized, the chloromercury group being replaced with iodine and an acyl group; in the presence of a palladium salt, they will react with the esters of acrylic acid, forming the esters of indolylacrylic acid.

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USSR

UDC 547.754:542.944.1

KOST, A. N., YUDIN, I. G., BUDYLIN, V. A., and ABDULLAYEV, M., Moscow State University imeni M. V. Lomonosov

"Indole Chemistry. XXV. Bromination of the Benzene Ring of Alkylindoles"

*Izvestiya Khimicheskikh Soyedineniy*, No 11, Nov 71, pp 1512-1516

**Abstract:** The effect of bromination of the benzene ring of eight alkyl-indoles was studied. The reaction was carried out in concentrated  $H_2SO_4$  (in the presence of  $Ag_2SO_4$ , to assure protonizing of the pyrrole part of the molecule and facilitate formation of the bromine cation). Paramagnetic-resonance, infrared and mass spectra were obtained to determine the structure of the eight substituted compounds. It was found that indoles with alkyl groups in the pyrrole ring are brominated in position 5, while introduction of an alkyl in position 7 may alter the orientation and lead to formation of a 6-isomer.

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USSR

UDC 547.831.3

LUGOVIK, B. A., YUDIN, I. G., BORODIN, P. V., VINOGRADOVA, S. M., and KOST, A. N., Moscow State University Imeni M. V. Lomonosov

"Reactions of 1,2-Dihydroquinolines. III. Addition of Benzene and Phenyl Halides to the Double Bond of 2,2,4-Trimethyl-1,2-dihydroquinolines"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 6, Jun 71, pp 795-797

Abstract: 2,2,4-Trimethyl-1,2-dihydroquinoline (I) does not react with benzene at room temperature, even with excess  $AlCl_3$ . When heated it yields products of di- and polymerization. On the other hand the hydrochloride or N-acetyl derivative of (I) adds benzene at room temperature. When  $AlCl_3$  is replaced by iron or zinc chloride or by strong mineral acids, the reaction does not take place at all. Solvents which are capable of forming stable complexes with  $AlCl_3$  -- such as diethyl ether, nitromethane, dibutyl ether, or nitrobenzene -- hinder the reaction. Substituting a benzyl group in position 1 or a methyl group into the aryl ring has practically no effect on the reaction, while the presence of a methoxy group in position 6 hinders the process considerably. Hence, addition of benzene to (I) requires a preliminary protonation or acylation of the amino group. Phenyl halides react under drastic conditions yielding only para-substituted 4-aryl-2,2,4-trimethyl-1,2,3,4-tetrahydroquinolines.

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1/2 009 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--INDOLE CHEMISTRY. XV. CONVERSION OF ARYLHYDRAZONES OF DELTA  
OXONITRILES INTO ALPHA CARBOLINES -U-  
AUTHOR--(03)-YUDIN, L.G., KOST, A.N., CHERNYSHOVA, N.B.  
COUNTRY OF INFO--USSR  
SOURCE--KHIM. GETEROTSIKL. SOEDIN. 1970, (4), 484-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--INDOLE, ORGANIC NITRILE COMPOUND, HYDRAZONE, HETEROCYCLIC  
NITROGEN COMPOUND, ORGANIC SYNTHESIS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3006/1020 STEP NO--UR/0409/70/000/004/0484/0488  
CIRC ACCESSION NO--AP0134732  
UNCLASSIFIED

2/2 009 UNCLASSIFIED PROCESSING DATE--13NOV70  
 CIRC ACCESSION NO--AP0134732  
 ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MIXT. OF 3.1 G  
 4-METHYL,5,OXOCAPRONITRILE AND 2.7 G PHNHNH SUB2 WAS HEATED 3 HR ON A  
 BOILING WATER BATH, THE SEPD. WATER REMOVED THE MIXT. EVAPD., 120 ML  
 ACOH ADDED TO THE RESIDUE, AND THE MIXT. REFLUXED 10 HR TO YIELD  
 32.5PERCENT I (R EQUALS R PRIME3 EQUALS H, R PRIME1 EQUALS R PRIME2  
 EQUALS ME), M. 262-3DEGREES (C SUB6 H SUB6); ACETYL DERIV. (R PRIME3) M.  
 132-3DEGREES (ETOH). SIMILARLY WERE OBTAINED I (R, R PRIME1, R PRIME2,  
 R PRIME3, M.P., AND PERCENT YIELD GIVEN): H, ME, H, H, 257-50DEGREES  
 (SIC), 8; ME, ME, H, H, 260-2DEGREES, 7; ME, ME, ME, H, 268-90DEGREES,  
 22.5; H, ME, H, AC, 110-110DEGREES, 93; ME, ME, H, AC, 121-2DEGREES, 85;  
 ME, ME, ME, AC, 152-3DEGREES, 84. FACILITY: MOSK. GOS. UNIV.  
 IN. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--KINETICS AND MECHANISM OF THE SULFONATION OF  
2,3-DIMETHYL,1,7,TRIMETHYLENEINDOLE IN CONCENTRATED SULFURIC ACID  
AUTHOR--(04)-VINNIK, M.I., ABRAMOVICH, L.D., YUDIN, L.G., BUDYLIN, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. ORG. KHIM. 1970, 6(5), 1061-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL-REACTION KINETICS, CHEMICAL REACTION MECHANISM,  
SULFONATION, SULFURIC ACID, AQUEOUS SOLUTION, INDOLE DERIVATIVE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY KEEL/FRAME--3006/1271 STEP NO--UR/0366/70/006/005/1061/1065  
CIRC ACCESSION NO--AP0134945  
UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70  
CIRC ACCESSION NO--AP0134945  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE REACTION IS 1ST ORDER.  
IT GIVES 2,3,DIMETHYL,1,7,TRIMETHYLENEINDOLE,5,SULFONIC ACID (I). THE  
STRUCTURE OF I WAS ESTABLISHED BY ITS CONVERSION TO THE AMIDE, ALSO  
PREPD. BY TREATING 2,3,DIMETHYL,1,7,TRIMETHYLENEINDOLE WITH CLSO SUB3 H  
TO GIVE THE ACID CHLORIDE OF I, WHICH WAS TREATED WITH NH SUB3. THE  
SULFONATION RATE CONSTS. INCREASE LINEARLY WITH SO SUB3 CONC. IN H SUB2  
SO SUB4 USED IN THE REACTION. FACILITY: INST. KHIM. FIZ.,  
MOSCOW, USSR.

UNCLASSIFIED

1/2 013 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--KINETICS AND MECHANISM OF REACTIONS IN CONCENTRATED STRONG ACID  
XXII. HYDROLYSIS OF 1,FORMYL,1,2,3,4,TETRAHYDROQUINALDINE IN AQUEOUS  
AUTHOR--ZARAKHANI, N.G., PROMYSLOV, V.M., YUDIN, L.G., VINNIK, M.I.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. FIZ. KHIM. 1970, 44(1), 52-6  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL REACTION KINETICS, HYDROLYSIS, AQUEOUS SOLUTION,  
SULFURIC ACID, CHEMICAL REACTION MECHANISM, QUININE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1987/1043 STEP NO--UR/0076/70/044/001/0052/0055  
CIRC ACCESSION NO--AP0104441  
UNCLASSIFIED

2/2 013

CIRC ACCESSION NO--AP0104441

UNCLASSIFIED

PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETICS OF HYDROLYSIS OF 1, FORMYL, 1, 2, 3, 4, TETRAHYDROQUINALDINE (I) TO 1, 2, 3, 4, TETRAHYDROQUINALDINE WAS MEASURED SPECTROSCOPICALLY (LAMBDA EQUALS 240 NM) IN 0.99 TO 59.60 PERCENT H SUB2 SO SUB4 AT 25.0 PLUS OR MINUS 0.1 DEGREE. THE REACTION IS IRREVERSIBLE AND 1ST ORDER IN I. DEPENDENCE OF K SUBEFF ON H SUB2 SO SUB4 CONC. SHOWS A MAX. AT 24 PERCENT IN ACCORD WITH THE DEPENDENCES OF CONCNS. OF H SUB3 O PRIME POSITIVE AND UNIONIZED FORM OF I. PK SUBBH PRIME POSITIVE OF I AT 25 DEGREES IS MINUS 2.00 PLUS OR MINUS 0.02. E SUBAKT WAS DETD. FROM KINETIC MEASUREMENTS AT 49.1, 59.0, 68.4, 77.7, AND 87.4 DEGREES (E SUBAKT, KCAL-MOL AND H SUB2 SO SUB4 CONC. PERCENT ARE GIVEN): 18.7 PLUS OR MINUS 1.4, 0.99; 21.7 PLUS OR MINUS 1.5, 54.74; 21.7 PLUS OR MINUS 1.5, 59.60.

UNCLASSIFIED

USSR

UDC 547.754:543:422.25.4.6:542.9.44.1

KOST, A. N., YUDIN, L. G., and ZINCHENKO, Ye. Ya., Moscow State University  
Imeni M. V. Lomonosov

"Indole Chemistry. XXXIV. Bromination of 5-Substituted Indoles"

Riga, Khimiya Geterotsiklicheskikh Soyedinenii, No 3, Mar 73, pp 332-336

Abstract: Bromination of 1,2-dimethyl-3-carbethoxy-5-hydroxyindole in acetic acid yields 1,2-dimethyl-3-carbethoxy-5-hydroxy-6-bromoindole. Bromination of the position C-4 occurs only when the C-6 position is already occupied. If the hydroxy group at C-5 is replaced by a methyl substituent, then the bromination yields a 6-substituted product; for example, 1,2,5-trimethyl-3-carbethoxyindole yields 1,2,5-trimethyl-3-carbethoxy-6-bromoindole. Dibromodioxane reagent also introduces bromine into the position C-6. 1,2-Dimethyl-3-carbethoxy-5-benzoyloxy-6-bromoindole can be obtained either by bromination of 1,2-dimethyl-3-carbethoxy-5-benzoyloxyindole or by benzylation of 1,2-dimethyl-3-carbethoxy-5-hydroxy-6-bromoindole. The same two reactions can be used to produce 1-phenyl-2-methyl-3-carbethoxy-5-acetoxy-6-bromoindole.

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USSR

UDC 621.384.633

DVORNIKOV, V. D., REZVOV, V. A., YUDIN, L. I.

"Current Micropulse Indications at Various Cyclotron Radii"

Moscow, Pribery i Tekhnika Eksperimenta, March-April, 1973, pp 41-44

Abstract: A description is given of the principal system developed by the authors for measuring the parameters of small bunchings of particle currents at various radii of the cyclotron in the Moscow Institute of Atomic Energy. The basic method of the system is the stroboscopic principle, discussed in an earlier article published in the journal noted above (I. D. Breslavtsev, et al, No 4, 1972, p 26). A block diagram of the system is given. To increase its sensitivity and to exclude the dependence of its input signal on the shift of the beam, two sensors were put at each radius, placed symmetrically with respect to the median density of the accelerator; preamplifiers were also used to help raise the sensitivity level. Basic schematic diagrams of the electronic equipment in the stroboscopic converter and frequency converter are also given. Results of measurements made with the device are presented. The authors thank N. I. Venikov and N. I. Chumakov for their support.

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USSR.

UDC: 621.374.2

BRESLAVTSEV, I. D., VENIKOV, N. I., DVORNIKOV, V. D., KULESHOV,  
I. L., LATUSHKIN, S. T., REZVOV, V. A., CHUMAKOV, N. I., and  
YUDIN, L. I.

"Use of 'Deviation Grouping' to Obtain Intense Short Neutron  
Pulses in the IAE Cyclotron"

Moscow, Pribory i Tekhnika Eksperimenta, No 4, July-August 1972,  
pp 26-31

Abstract: A system is described for the formation and diagnostics of a beam of neutrons using the method of deviation grouping. Similar to that of Karlsruhe, as described by S. Cierjacks et al (Rev. Scient. Instrum., 39, 1968, p 1279), the system involves a packet of ions cut by a pulsed voltage of an internal deflector and accelerated to the proper energy level. The ions are deflected vertically to a target whose thickness is larger than the ion path, and as a result of the impact of the particles on the target, short intense neutron pulses are obtained. A detector, recording the neutrons' energy spectrum, is placed at a distance of 13.5 m from the target. Unlike the Karlsruhe cyclotron, however, the IAE has two 180° duants, such that it is impossible to place all elements of the system in the space outside them. The setup

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UDC: 621.374.2

BRESLAVTSEV, I. D., et al, Pribory i Tekhnika Eksperimenta, No 4, July-August 1972, pp 26-31

involving the IAE cyclotron is described, together with the electronic equipment, and a sketch of the instrumentation is given in block form. A neutron pulse frequency of as much as 110 kHz is obtained. The authors are associated with the Institute of Atomic Energy at Moscow.

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USSR  
I. Probability Theory and Mathematical Statistics  
A. Probability Theory

USSR  
YUDIN, M. D.

UDC: 519.2

"Concerning Limiting Distributions of Sums of Symmetrically Dependent Random Quantities"

Uch. zap. Ivanov. gos. ped. in-ta (Scientific Notes of Ivanovo State Pedagogical Institute), 1972, 117, pp 160-171 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V21 by L. Osipov)

Translation: The author considers a sequence of series of random quantities  $\{\xi_{nk}; k=1, \dots, n; n=1, 2, \dots\}$ . The system  $\{\xi_{nk}\}$  is termed  $f(n)$ -dependent if the aggregates  $\xi_{n1}, \dots, \xi_{ns}$  and  $\xi_{ns+1}, \dots, \xi_{nn}$  are independent when  $s-r > f(n)$ . System  $\{\xi_{nk}\}$  is termed symmetrically dependent if the conditional distributions of the quantities  $\xi_{n1}, \dots, \xi_{ns}$  coincide for the condition  $\xi_{ns} \in A$  and for the condition  $\xi_{ns} \in A'$  where  $A$  and  $A'$  are subsets of a straight line which are symmetric relative to the zero point, and  $i_p \neq k$  for all  $p=1, \dots, s$ . The following statements are proved. If the sequences of series  $\{\xi_{nk}\}$  of symmetrically distributed random quantities are symmetrically  $f(n) = n^{\frac{1}{2}-\rho}$ -dependent,  $0 < \rho \leq \frac{1}{2}$ , and at certain constants  $H_1$

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USSR

YUDIN, M. D., Uch. zap. Ivanov. gos. ped. in-ta, 1972, 117, pp 160-171

and  $H_2$  -  $M\xi_{nk}^2 < H_1 n^{-1} \log n$ ;  $M|\xi_{nk}^2 \xi_{nj}| < H_1 n^{-3/2} \log n$ ,  
 $0 < s-k < n^{1/2}$ .

and in addition for any  $\tau > 0$  and  $n \rightarrow \infty$ ,  $\sum_k M\xi_{nk}^2 \rightarrow 0 < \infty$ ,  $\sum_k M\xi_{nk}^2 I_{|\xi_{nk}| > \tau} \rightarrow 0$ ,

then the distribution of the sum  $\sum_k \xi_{nk}$  converges weakly to  $(0, \sigma^2)$ -normal distribution. An analogous result obtains when the condition of  $f(n)$ -dependence is replaced by the condition of uniformly strong intermixing.

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acc. Nr.:

AP0042630

Ref. Code:

UR9067

JPRS 52162

Conference on Oceanology, Atmospheric Physics, Geography

(Summary: "Session of the Department of Oceanology, Atmospheric Physics and Geography Academy of Sciences USSR in Leningrad," by M. V. Zavarina; Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geograficheskaya, No 1, 1970, p 147)

A scientific session of the Department of Oceanology, Atmospheric Physics and Geography of the Academy of Sciences USSR was held in Leningrad during the period 1-2 July 1969. It was devoted to the most important meteorological problems associated with the study of other natural processes and the use of natural resources in the national economy. D. V. Nalivkin discussed the overall aspects of the study of strong winds in relation to processes in the lithosphere and hydrosphere, emphasizing that their interaction with the atmosphere is most important at the time of catastrophic phenomena. M. I. Yudin gave a review of exceptionally severe dust storms over the European part of the USSR during the last 100 years and devoted much attention to the dust storms of 1969 affecting the Ukraine. The speaker felt that his theory of turbulent diffusion of heavy particles can be applied for studying the mechanics of dust storms. Yudin feels that shelterbelts are the most effective means for protecting soils

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against wind erosion. M. I. Budyko, in a report entitled "Study of Solar Radiation and its Transformations at the Earth's Surface," generalized the research work already done in this field and told of the existing sources of information and the many spheres of its use. He devoted particular attention to the energy processes in the vegetation cover (photosynthesis process). A. F. Treshnikov reported on studies of the Arctic and hydro-meteorological servicing of the national economy in the north. The studies made during the last 15-20 years from drifting stations and by air expeditions have yielded much information on bottom relief, formation and circulation of air and water masses and the ice regime of the Arctic Ocean. The physicommechanical properties of ice of different ages have been studied and practical recommendations given on the design and power of engines for ice-breakers and other vessels. This report also examined the prospects for further Arctic research. K. Ya. Kondrat'yev told of surveys of natural resources made using artificial earth satellites. He discussed the many aspects of this problem, emphasizing the importance of global surveys, commented on advances in satellite meteorology, advanced the idea of a lunar meteorological station and the desirability and feasibility of using space-ships in geophysical research. He described the work of the Aerospace Methods Laboratory at Leningrad State University. K. S. Shifrin gave a report on "Light Scattering as a Method for Studying the Structure of

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Natural Media"; it dealt with some problems in atmospheric optics of applied importance. The speaker described two methods for determining the size of scattering particles from measurements of the intensity of a scattered parallel beam in the medium: the small angles method and the spectral transparency method. It was emphasized that the theoretical data obtained by solving an integral equation correlate well with experimental data.

3/3

19760679



1 2/2 016 UNCLASSIFIED PROCESSING DATE--3006170  
TITLE--CONTINUOUS PROCESS FOR COOKING AND PRODUCING LEAD CRYSTAL TABLEWARE

-U-  
AUTHOR--(05)-MOKHNIN, N.F., FIGUROVSKIY, I.A., SAVONICHEV, G.V., ZUBANOV,  
V.A., YUDIN, N.A.  
COUNTRY OF INFO--USSR

SOURCE--STEKLO KERAM. 1970, 27(2), 8-10

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--LEAD, METAL CRYSTAL, GLASS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1996/1991

STEP NO--UR/0072/70/027/002/0008/0010

CIRC ACCESSION NO--AP0118950

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118950

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COM. TECHNOLOGY FOR CONTINUOUS PRODUCTION OF TABLEWARE ARTICLES MADE FROM LEAD CRYSTAL WAS WORKED OUT FOR THE 1ST TIME. A BRIEF HISTORY OF THE PROBLEM AT HAND IS PRESENTED. AN ATTEMPT WAS ALSO MADE TO OBTAIN THE NECESSARY DATA FOR DESIGNING FUTURE FURNACES WITH A LARGER CAPACITY. THE BOUNDARY CONDITIONS WERE DETD. FOR THE CASE OF HEATING THIN AND MASSIVE BODIES SIMULTANEOUSLY BY RADIATION AND CONVECTION. THE COMPLEX HEAT TRANSFER IN THE UPPER CHAMBER WAS ALSO INVESTIGATED. PB OXIDE LOOSES FROM THE MELT ARE DECREASED BY USING AIR PREHEATED AND SATD. BY VOLATILE COMPONENTS IN A REGENERATIVE HEAT EXCHANGER. THIS METHOD ALSO IMPROVES THE HEAT TRANSFER IN THE FURNACE. FURTHERMORE, SUCH A PRODUCTION SETUP IS MUCH MORE ECONOMICAL. FACILITY: UPR. VLADIMIRSTEKO, VALIDIMIR, USSR.

UNCLASSIFIED

USSR

UDC 632.95

KOST, A. N., YUDIN, N. B., CHERNYSHEVA, N. B., TERENIN, V. I., Moscow  
University

"A Method of Making  $\beta$ -Indolyl Carboxylic Acid Amides"

USSR Author's Certificate No 339542, filed 10 Sep 70, published 23 Jun 72  
(from RZh-Khimiya, No 9, May 73, abstract No 9N558 by T. G. Chekareva)

Translation: Amides of  $\beta$ -indolyl carboxylic acids, which may find application as growth regulators for plants and microorganisms or as intermediates for synthesizing medicines, are synthesized by saponification of the corresponding nitriles with concentrated  $H_2SO_4$  while cooling to  $0-5^\circ C$ . Example. 3.12 g of 3-indolyl acetonitrile are added to 25 ml of concentrated  $H_2SO_4$  cooled to  $0^\circ C$  while mixing and cooling. The mixture is allowed to stand for 16 hours at about  $20^\circ C$ , poured over ice, alkalized with a concentrated aqueous solution of  $NH_4OH$ , and the precipitate is isolated, giving 1.74 g of 3-indolyl acetamide, melting point  $153^\circ C$  (water), yield 50%. The following compounds of type I are synthesized by analogous methods (given are the compound, melting point,  $^\circ C$ , and yield, %): 3-(3-indolyl)-propioamide, 134, 53; 3-(2-methyl-3-indolyl)-propioamide, 125-6, 99; 3-(2-methyl-5-chloro-3-indolyl)-propioamide, 145-6, 91.

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1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--ONE MORE SOURCE OF THE ADDITIONAL STRUCTURE OF DIPOLE RESONANCES  
-U-  
AUTHOR--(05)-ZHIVOPISTSEV, F.A., NAGAR, N.EL., SHITIKOVA, K.V., YUDIN,  
N.P., AKBARY, M.Y.  
COUNTRY OF INFO--USSR  
SOURCE--PHYS. LETTERS (NETHERLANDS), VOL. 31B, NO. 6, P. 347-9 (16 AMRCH  
1970)  
DATE PUBLISHED--16MAR70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--DIPOLE INTERACTION, NUCLEAR ENERGY LEVEL, NUCLEAR RESONANCE,  
INELASTIC SCATTERING, PARTICLE INTERACTION, ELECTRON HOLE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1992/0442 STEP NO--NE/0000/70/031/006/0347/0349  
CIRC ACCESSION NO--AP0111635  
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0111635

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. STRUCTURE ARISING FROM THE  
COUPLING OF 3 PRIME NEGATIVE STATES WITH PARTICLE HOLE STATES IS  
CALCULATED.

FACILITY: MOSCOW STATE UNIV., USSR.

UNCLASSIFIED

USSR

UDC: 621.374.33

CHULAK, S. A., YUDIN, P. Ye.

"Analysis of the Transient Process When an Isolated Controlling Pulse of Limited Duration is Used for Actuating a Thyristor Shunted by an RC Network"

Tr. Proyektno-konstrukts. i tekhnol. in-ta tyazh. elektromashinostr. (Works of the Design and Planning Technological Institute of Heavy Electrical Machine Building), Khar'kov, "Elektrotyazhmash" Plant, 1970, 1, pp 132-136 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 10268)

Translation: An analysis is made of physical processes which take place when a thyristor is switched into an active inductive load. Consideration is given to a method of shunting the thyristor with an RC network to ensure reliable actuation with any controlling pulse length. A procedure is given for calculating the parameters of the RC network. Experimental confirmation is given for the validity of the computational relationships. Bibliography of one title. Resumé.

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USSR

Optical

SAPRYKIN, E. G., YUDIN, R. N., ATUTOV, S. N.

UDC 621.373.535

"Self-Mode-Selection of a 0.63 Micron Laser with Augmented Pressure in the Discharge Tube"

Leningrad, Optika i Spektroskopiya, Vol XXXIV, No 4, 1973, pp 755-761

Abstract: An experimental study was made of the spectral composition of the radiation of an He-Ne Laser ( $\lambda = 0.63$  microns) with augmented pressure in the discharge tube. Powerful single-mode generation was obtained without using selection elements in the resonator. The generation conditions of the laser are described. With an increase in pressure the multimode generation becomes single mode. The power of the single mode generation can be half the maximum power of the laser. A study was made of several structural designs for the single mode lasers with pressure mode selection.

A plane-spherical resonator with a conical tube repeating the transverse field distribution of the resonator provided the most efficient suppression of the transverse modes. This made it possible to obtain the highest power in one mode. The various transverse modes are fed from spatially different groups of atoms, and the competing binding among them is attenuated. Thus, the single-mode regime begins at a higher pressure than in the case of modes of one type, and it has lower power. The conical tube repeating the configuration of the regulator field promotes the obtaining of one mode inasmuch as

USSR

SAPRYKIN, E. G., et al., Optika i Spektroskopiya, Vol XXXIV, No 4, 1973, pp 755-761

the primary contribution to the amplification is made by the thin part of the tube, and the field effects in this part of the tube are greater. A large volume of gas in the entire tube promotes significant power. Thus, in the described laser with a plane-spherical resonator, in spite of the appreciably shorter length the single mode generation power was greater than in a laser with a symmetric spherical resonator. There was no necessity for suppressing the generation on the 3.39 micron transition.

2/2

- 114 -



USSR

UDC 678.643.01:53

2

GOLUBENKOVA, L. I., DEMEKHINA, YE. M., CHIBISOV, YE. I., SMIRNOVA, L. N., EKSANOVA, N. D., and YUDIN, V. F.

"Binders for Fiberglass-reinforced Plastics Based on Epoxy Resin ETF"  
Moscow, Plasticheskiye Massy, No 6, 1970, pp 13-15

Abstract: In order to increase the thermostability of fiberglass-reinforced plastics, work is being done to create binders based on epoxy resins which differ in structure from diene resins, primarily cycloaliphatic and polyfunctional epoxy resins. Polyfunctional resin ETF, which is the product of the interaction of 1,1,3-tri-(hydroxy-phenyl)-propane and epichlorohydrin, has a molecular weight of 540-700 and contains 20-24 percent epoxy groups. Hardening of this resin with amine or acid hardeners makes it possible to obtain specimens possessing higher thermostability than diene epoxy resins. The greatest bending strength is found in specimens hardened with aniline-phenol-formaldehyde resin 211, the greatest compression strength in specimens hardened with maleic anhydride. Aniline-phenol-formaldehyde

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USSR

GOLUBENKOVA, L. I., et al., *Plasticheskiye Massy*, No 6, 1970, pp 13-15

resin 211 was chosen as the main hardener. The binder representing a composite of resins ETF and 211 has been given the brand designation T-71-S. Since resin ETF softens in the 35-55° C range, it can be used for the "dry" process of fiberglass-reinforced plastics manufacture. The properties of the binder applied to the glass cloth, as well as of the resultant fiberglass-reinforced plastics depend on the character of the solvent used to impregnate the glass filler and the storage conditions for the impregnated cloth.

2/2

# TECHNICAL TRANSLATION

FSIC-HT-23-1057-72

ENGLISH TITLE: Certain Inverse Problems of Determining Parameters and Modeling of Heat Exchange

FOREIGN TITLE:

AUTHOR:

G. N. Zaslav, V. M. Yudin

SOURCE:

Teplotnye naryazheniya v elementakh konstruktivnoy  
No. 9, 1970, pp. 59 - 70

Translated for FSIC by Eileen Wegner, Leo Kanner Associates

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YUDIN, V. M.

USSR

UDC 629.629.7.036.54:536.46

SHELUKHIN, G. G. and YUDIN, V. O.

"Investigation of Vortex Flow in a Semienclosed Volume During the Combustion Instability of Condensed Systems"

Odessa, 11-ya Vses. Konf. po Vopr. Ispareniya, Goreniya i Gaz. Dinamiki Dispersn. Sistem, 1972--Sbornik (11th All-Union Conference on Problems of the Evaporation, Combustion, and Gas Dynamics of Dispersed Systems, 1972--Collection of Articles), 1972, p 67 (from Referativnyy Zhurnal--Aviatsionnyye i Raketnyye Dvigateli, No 1, 1973, Abstract No 1.34.125. Resume)

Translation: Research on vortex flow showed that unsteady combustion in a semienclosed volume of condensed systems and combustion in narrow channels are brought about by the origination of vortex flow, the parameters of which change in time. The origination of vortex flow leads to an increase of the combustion rate and the creation of a considerable moment. Axial blow-off brings about an increase in the combustion stability of condensed systems. An investigation was made of the influence of vortex flow in a semienclosed volume upon the combustion rate and upon the combustion stability of condensed systems.

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USSR

UDC 632.95

YUDIN, V. P.

"Effects of the Herbicide Trialate on the Quality of Wheat Grain"

Izv. Irkutsk. S.-Kh. In-ta [News of Irkutsk Agricultural Institute], Vol 1, Part 1, No 30, 1972, pp 3-6 (Translated from Referativnyy Zhurnal Khimii, No 24(II), 1972, Abstract No 24N631, by T. A. Belyayeva)

Translation: The results of experiments involving the application of trialate show that the herbicide causes no reduction in harvest of wheat, in most versions the weight of 1000 grains increased, the bulk weight of the grain changed slightly, and increase of the quantity of grain of the most valuable fraction (over 2.5 mm) was facilitated, the yield of dry gluten increased. The quality of the gluten was decreased in some cases. When trialate was used, no decrease in the quantity of nitrogenous substances in the wheat grain was noted. The herbicide was tested in two forms: a 60% emulsion concentrate and a 10% granulated preparate, in doses of 0.75-2.5 kg/hectare.

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USSR

UDC 534.322.2+534.83

TOLMACHEV, A. V., YUDIN, YE. YA.

"Study of Noise Generated by Throttling and Regulating Devices in Air Ducts"

Nauchn. tr. NII stroit. fiz. Gosstroya SSSR (Scientific Works of the Scientific Research Institute of Structural Physics of Gosstroy USSR), 1970, No 1(13), pp 81-94 (from RZh-Fizika, No 12(II), Dec 70, Abstract No 12Zh775)

Translation: A study of noise emitted by throttling devices placed in air ducts is discussed. The experimental setup was described previously by the authors (see RZh-Fizika, 1968, 12Zh634). It is evident from the relationships obtained for the spectrum of the emitted noise that the high-frequency components rise with an increase in flow rate and the noise drops with an increase in the area of the opening. To reduce noise in throttling, it is recommended that devices be supplied with a centrally located opening. Typical relationships for the total levels of sound intensity of the noise are observed in two segments with proportionality laws of the 6th and 4th powers of the flow rate (see also RZhFiz, 1968, 11Zh421). Several mechanisms are proposed for explaining the 4th power law.

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USSR

TOLMACHEV, A. V., YUDIN, YE. YA., Nauchn. tr. NII stroit. fiz. Gosstroya SSSR, 1970, No 1(13), pp 81-94

Formulas are obtained on the basis of dimensionality theory for determining the sound intensity of noise as a function of flow rate, transverse cross section of the tube, and the coefficient of local resistance of the element. Formulas are also given for determining the critical rate when the sound intensities of the two components of the noise are equal to one another. An example is given of calculating noise emitted by an actual element of an air duct. I. Volkov.

UDC 534.322.2+534.83

USSR

POKROVSKIY, B. V., YUDIN, YE. YA.

"Hydrodynamic Noise and Vibration of Centrifugal Pumps"

Nauchn. tr. NII stroit. fiz. Gosstroya SSSR (Scientific Works of the Scientific Research Institute of Structural Physics of Gosstroy USSR), 1970, No 1(13), pp 5-25 (from RZh-Fizika, No 12(II), Dec 70, Abstract No 127h773)

Translation: A study of vortex noise and vibration was carried out on smooth rods with different profiles rotating in a cylindrical body, in tubes with different roughness placed in the wind tunnel of the All-Union Scientific Research Design and Technological Institute of Hydraulic Machinery, and also on pumps with wheels and helixes of different roughness encountered in practice in pump construction. It was established by the experiments that the intensity of the noise and vibration generated by the vortex sources of oscillations is proportional to the 6th power of the velocity and the 2nd power of the characteristic dimension of the body. A change in the mass, elastic properties, and internal quenching of the material of the rods does not affect this law. The spectra of vortex noise and

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USSR

POKROVSKIY, B. V., YUDIN, YE. YA., Nauchn. tr. NII stroit. fiz. Gosstroya SSSR, 1970, No 1(13), pp 5-25

vibration cover a wide frequency region (800-20,000 Hz) and have a uniformity nature with a clearly expressed maximum. The position of this maximum depends to a considerable degree on the relationship between the natural frequencies of the system and the frequencies of the generated vortices. The roughness, in not changing the character of the dependence of noise and vibration on velocity, effects the value of their levels. An increase in the roughness of the helix causes a rise in the levels of the noise and vibration considerably greater than a similar increase in the roughness of the channels of the pump. From these dependencies of the vibration and noise levels on flow velocity, it was evident that at sufficiently high flow velocities the 6th power law holds not only for a flow with burbling but for a continuous flow over the surfaces. The generation of noise and vibration of centrifugal pumps under inhomogeneous flow has the following characteristic properties: 1. The spectrum of the frequencies emitted is discrete and has components of a harmonic sequence in terms of frequency determined by the product of the number of blades times the number of revolutions per second; 2. the intensity of noise and vibration increases in proportion to the 4-6th power of the circular velocity. In the case of purely hydrodynamic pulsations, the 4th power is observed. If pulsations have an acoustical character i.e., are associated with the compressibility of the liquid the noise and vibration are subject to a 6th power law. In this case the generation of hydrodynamic

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USSR

POKROVSKIY, B. V., YUDIN, YE. YA., Nauchn. tr. NII stroit. fiz. Gosstroya SSSR, 1970, No 1(13), pp 5-25

noise from inhomogeneity of flow and vortex formations has a dipole character ( $I \sim U^6 D^2$ ); 3. the magnitude and frequency of the pulsation force acting on the tongue of the helix depends on the gap between the tongue and the wheel, the shape of the tongue, the number and thickness of the blades at the output, the angle of the output, and the operating mode of the pump. Detailed information is given on the effect of structural factors on noise and vibration from flow inhomogeneities. 16 references. V. A. Moor.

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Acoustical

USSR

UDC 534.2

YUDIN, Ye. Ya., and SEVERNNA, N. N.

"Study of Noise Formation in Throttling Devices When Measuring Noise Characteristics of Fan"

V sb. Novyye metody issled. shumov i vibratsiy i kibernet. diagnost. mashin i mekhanizmov (New Methods of Studying Noises and Vibrations and Cybernetic Diagnostics of Machines and Mechanisms -- collection of works), Kaunas, 1970, pp 29-30 (from RZh-Mekhanika, No 12, Dec 70, Abstract No 12B255, by G. P. Karaushev)

Translation: Acoustical characteristics of throttles of the washer-grille type used in aerodynamic tests of fans were experimentally studied. The advantage of this class of throttle over others (for example, slide valves, throttle-valves, and others) is that it produces diffuse drag, not twisting the flow and not inducing additional turbulence. It is shown that, except for low frequencies, throttles of the washer-grille type make much less noise than do fans.

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USSR

UDC 616.981.452-022.39-036.23-078.7(479)

CHERCHENKO, I. I., OGANYAN, Ye. F., YUNDIN, Ye. V., NAYDEN, P. Ye., YEMEL'YANOV, P. F., GOLUBEV, P. D., FILIMONOVA, Yu. A., GONCHAROV, A. I., LABUNETS, N. F., BABAYEV, M. R., ANANYAN, Ye. L., and KHANGULYAN, E. K., Scientific Research Antiplague Institute of the Caucasus and Transcaucasus, and Antiplague Stations, Azerbaydzhan SSR and Armenian SSR

"Experience in Serological Detection of Plague in Rodent Nest Substrate and in Predatory Bird Pellets Under Field Conditions in Natural Foci of the Caucasus"

Moscow, Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii, No 3, 1973, pp 15-20

Abstract: Use of the antibody neutralization reaction (ANR) employing plague antigenic erythrocyte diagnosticum was studied as a serological alternative to detection of plague by bacteriological analysis, for which it is not always possible to gather test material in the field. The study was based on the experimental finding that plague F1 antigen persists in the environment long after an epizootic has subsided. In the first phase, three areas in the Caucasus in which epizootics had been registered previously were studied in 1969-1971. Samples of rodent nest substrate were found to contain F1 antigen by the ANR, whereas bacteriological methods were generally unsuccessful,

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CHERCHENKO, I. I., et al., Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii, No 3, 1973, pp 15-20

indicating the usefulness of this method for retrospective analysis. In the second phase an area in which epizootics had not been recorded previously was studied in 1970-1971. While the ANR revealed the presence of F1 antigen in rodent nest substrate, bacteriological analysis did not produce such evidence until 4 months later. This result indicated that the method is also preferential for early detection of plague epizootics. In the final phase pellets regurgitated by predatory birds feeding on plague-carrying rodents were subjected to the ANR. Once again F1 antigen was detected in areas without previous epizootic history up to 2 months prior to detection by bacterial analysis. As a control pellets from an area known to be free of plague for 40 years was subjected to the ANR, and the results were negative. Thus the ANR is shown to be a suitable and preferential method for retrospective and early field detection of natural plague foci.

2/2

- 10 -

1/2 028  
UNCLASSIFIED  
TITLE--VISIBLE CRACK FORMATION SITES INITIATED BY LASER BEAMS -U-  
PROCESSING DATE--23OCT70  
AUTHOR--(04)-AGRANAT, H.B., NOVKOV, N.P., YUDIN, YU.I., YAMPOLSKIY, P.A.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TVERD. TELA 1970, 12(3), 924-7  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, PHYSICS  
TOPIC TAGS--LASER BEAM LESION, CRACK PROPAGATION, POLYMETHYLMETHACRYLATE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/1723  
STEP NO--UR/0181/70/012/003/0924/0927  
CIRC ACCESSION NO--AP0120435  
UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0120435

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MICROSCOPIC EXAMN. OF POLY(ME  
METHACRYLATE) (I) SAMPLES IRRADIATED WITH A LASER BEAM (LAMBDA EQUALS  
1.06 MU) AT AN ANGLE OF 45DEGREES OR 90DEGREES, SUGGESTED THAT THE STRESS  
APPLIED ON I (0-300 KG-CM PRIME2) FACILITATED THE OPENING OF MICROPORES  
AND FORMATION OF SUBMICROSCOPIC CRACKS WHICH, IN TURN, INITIATED FURTHER  
CRACKING AND EVENTUAL BREAKDOWN OF I. FACILITY: INST. PROBL.  
MEKH., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 669.017:548.526

GAL', V. V., GRUZIN, P. L., and YUDINA, G. K., Central Scientific Research  
Institute of New Metallurgical Technology imeni I. P. Bardin

"Study of Surface Diffusion of Metals by Autoradiography"

Moscow, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 950-956

Abstract: The regularities of surface diffusion were studied for sources used in the study of migration by autoradiography. Formulas are presented for the processing for data produced by contact autoradiography is checked on the basis of results of an earlier work. Processing of the results of the work (by Winegard and Chalmers) produced the temperature dependence of the surface self-diffusion factor of silver as 19.9 Kcal/mol, satisfactorily agreeing with the figure of 12 Kcal/mol produced by Suzuoka.

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Acc. ~~AP~~:0034398

Ref. Code: UR 0297

PRIMARY SOURCE: Antibiotiki, 1970, Vol 15, Nr 2, pp 145-150

EFFECT OF FATS ON INTENSITY OF STAINING WITH VITAL STAINS IN CELLS  
OF PENICILLIUM CHRYSOGENUM

Yudina, O. D.; Dmitriyeva, S. V.; Buneyeva, T. A.

National Institute for Antibiotics, Moscow

It was shown that absorption of the vital stains, such as neutral red and erythrosin by the cytoplasm of *P. chrysogenum* grown in the presence of fat was more intensive. Addition of fat to the medium had a transitory toxic effect on the young cells of the penicillin-producing organism. Addition of fat to old cultures of the penicillin producer resulted in severe damages of the cytoplasm. Sunflower oil was more toxic for the cells of *P. chrysogenum* as compared to whale fat.

D. A.

1/1  
REEL/FRAME  
19711058

6

USSR

UDC: 621.317:621.372.852.3

PETROSYAN, F. N., DEVIATKOV, G. K., YUDINA, O. S.

"A Speed Reducer for a Polarization Attenuator With Uniform Scale in Decibels"

Tr. VNI Fiz.-tekhn. i radiotekhn. izmereniy (Works of the All-Union Scientific Research Institute of Physicotechnical and Radio Engineering Measurements), 1970, vyp. 2(32), pp 66-71 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A209)

Translation: The paper describes a speed reducer designed for making a polarization attenuator with uniform scale in decibels, which is especially convenient for use in systems with automatic recording of a change in signal level. Two illustrations, one table.

1/2 014 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--PREPARATION OF A VANADIUM CATALYST FOR THE OXIDATION OF SULFUR  
DIOXIDE -U-  
AUTHOR-(04)-BORESKOV, G.K., DZISKO, V.A., SAMAKHOV, A.A., YUDINA, T.O.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 266,737  
REFERENCE--TOKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--01APR70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--METAL CATALYST, CHEMICAL PATENT, CHEMICAL SYNTHESIS, VANADIUM,  
OXIDATION, SULFUR DIOXIDE, SILICA GEL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3004/1742 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0132008  
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AA0132008

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. A V CATALYST FOR SO SUB2 OXIDN.  
WAS OBTAINED BY MIXING SILICA GEL WITH NA SUB2 SO SUB4, K SUB2 SO SUB4,  
AND V COMPODS. TO OBTAIN A CATALYST ACTIVE AT LOW TEMPS. AT TO PROTECT  
THE EQUIPMENT FROM PREPG. CATALYSTS FROM CORROSION, A GEL OF HYDRATED V  
SUB2 O SUB5 OBTAINED BY THE ADHESION OF DIL. H SUB2 SO SUB4 TO A SOLN.  
OF K VANADATE TO CONST. PH 4 PLUS OR MINUS 1 WAS FOR A V COMPOD.  
FACILITY: INSTITUTE OF CATALYSIS, ACADEMY OF SCIENCES, U.S.S.R.

UNCLASSIFIED

Environmental and Ecological Problems

USSR

UDC 613.164(47-21

SOLDATKINA, S. A., NOVIKOV, Yu. V., and YUDINA, T. V., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman, Moscow

"A Hygienic Assessment of the Effects of City Noise"

Moscow, Gigiyena i Sanitariya, No 3, Mar 73, pp 16-20

Abstract: Rats were exposed to the action of city traffic noises with an intensity of 80 dBA for 6 hrs per day during one month. Adverse effects of the noise on the nervous and cardiovascular systems were found to take place. Disturbances in ascorbic acid metabolism were induced which resulted in a decrease of the content of this vitamin in a number of organs (adrenals, brain, liver, kidneys, spleen, testes) during the initial part of the period of exposure, followed by an increase towards the end of this period. A decrease of the content of ascorbic acid in the adrenals may be regarded as indicating development of protective reactions forming a part of a general adaptation syndrome. The content of histamine in the brain increased by 87 percent towards the 15th day of exposure, dropping to 8.7 percent above that of controls on the 30th day. The permeability of the histohematic barriers of the kidneys was increased.

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USSR

UDC 614.72:547.264

BAYKOV, B. K., GUSEV, M. I., NOVIKOV, Yu. V., and YUDINA, T. V., Moscow  
Scientific Research Institute of Hygiene imeni F. F. Erisman, Moscow

"The Biological Action of Butyl Alcohol as an Atmospheric Pollutant"

Moscow, Gigiyena i Sanitariya, No 2, Feb 73, pp 13-17

Abstract: In a study carried out on female rats, the effects of BuOH present in concentrations of 0.1, 1.0, and 20 mg/m<sup>3</sup> in the air were investigated. The air containing BuOH was passed for 92 days at a rate of 30 l./min through chambers into which the animals had been placed. The general condition and weight of the animals, their fertility, the latent period of the defense reflex reaction, the level of nucleic acids in the blood, the porphyrin metabolism, the activity of enzymes (oxidase, catalase, and diastase) in the blood, the utilization of O<sub>2</sub>, and the permeability of the histohematic barriers of organs were subjected to study in the course of the experiment. The results showed that BuOH in the concentration of 20 mg/m<sup>3</sup> produced pathological changes in the values of the indexes measured and therefore was toxic, whereas exposure of the animals to this substance in the two lower concentrations did not produce conditions or reactions that differed significantly from those shown by controls. Among the effects produced

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USSR

BAYKOV, B. K., et al., Gigiyena i Sanitariya, No 2, Feb 73, pp 13-17

by BuOH in the toxic concentration were a lowering of fertility, wave-like changes in the latent time of the defense reflex reaction, a reduction of the content of catalase in the blood, an increase in the diastase activity, and a reduction in the utilization of  $O_2$ . There was no decrease in the weight of the animals vs. controls as a result of exposure to BuOH.

2/2

- 67 -

USSR

UDC 614.715:614.72

YELFIMOVA, YE. V., Candidate of Medical Sciences, GUSEV, M. I., Professor, NOVIKOV, YU. V., Doctor of Medical Sciences, YLIDINA, T. V., SERGEYEV, A. N., Candidate of Medical Sciences, Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman

"Study of the Combined Resorptive Effect of Atmospheric Pollution (Gas and Dust)"

Moscow, Gigiyena i Sanitariya, No 8, 1972, pp 11-15

Abstract: A study was made of the combined effect of sulfur dioxide, carbon monoxide, phenol and finely dispersed dust characteristic of the air pollution caused by ferrous metallurgy enterprises. Experimental studies were performed on white rats for 96 days in the presence of an aerosol with the following concentrations:  $\text{SO}_2$  0.05 mg/m<sup>3</sup>, CO 1 mg/m<sup>3</sup>, phenol 0.01 mg/m<sup>3</sup> and 0.15 mg/m<sup>3</sup> of dust. Significant changes took place in the animals with respect to all tests. The effect of the aerosol in a concentration of 0.5 mg/m<sup>3</sup> implies a reduction in the total nucleic acids and the permeability of the histohematic barriers in the ovaries. One group of rats underwent stable changes in behavior and biochemical and physiological reactions. The total combinations of fractional concentrations of the substances with respect to their threshold values at a level less than one (0.76) has no effect on the animals.

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USSR

YELFIMOVA, YE. V., et al., Ggigiyena i Sanitariya, No 8, 1972, pp 11-15

The combined resorptive effect of small concentrations of sulfur dioxide, carbon monoxide, phenol and dust is characterized by the summation effect. In estimating the degree of pollution of the atmospheric air in samples taken around the clock, a level for which the total fractional concentration does not exceed 0.76 of the maximum permissible concentrations is recommended.

2/2

USSR:

UDC 612.388.014.46-087.45

SMIRNOVA, R. D.; NOVIKOV, Yu. V.; YUDINA, T. V.; KOS'MINA, L. F.;  
TAMBOVTSEVA, A. M.; Candidates of Medical Sciences, Moscow  
Scientific Research Institute of Hygiene imeni F. F. Erisman

"Permeability of the Histochematic Barriers and Some Biochemical  
Indices After the Combined Effect of a Number of Substances"

Moscow, Gigiyena i Sanitariya, No 7, 1971, pp 19-23

Abstract: Radioisotope ( $P^{32}$ ) study was conducted of the effects  
of chronic administration of six substances (isopropylbenzene  
and its hydroperoxide, propylbenzene, butylbenzene, acetophenone,  
and dimethylphenylcarbinol) on the permeability of various rat  
organs (liver, kidneys, spleen, pancreas, thyroid, adrenals,  
testes, hypophysis), blood catalast activity, vitamin (C and  
carotene) metabolism, and liver function. The combination of  
organic compounds was found to decrease the permeability of the  
histochematic barriers of the hypophysis and testes and, to a

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USSR:

SMIRNOVA, R. D., Gigiyena i Sanitariya, No 7, 1971, pp 19-23

lesser extent, spleen and kidneys. Catalase activity and vitamin C content was lower while the carotene content was higher in the experimental animals than in the controls. Liver function (bromsulphalein test) was also impaired. However, the animals' external appearance, behavior, and weight changes were indistinguishable from the control during the nine months of the experiment.

2/2

USSR

UDC 613:[612.388-064-088.9:539.16

YUDINA, T. V., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman

"Determination of the Permeability of Histo-hematic Barriers in Hygienic Investigations by Means of Radioactive Indicators"

Moscow, Gigiyena i Sanitariya, No 8, Aug 70, pp 75-78

Abstract: A study was made of the permeability of the histo-hematic barrier (HHB) in rats. It was shown that the use of radioactive phosphorus represents an efficient means of evaluating the effects of low-intensity factors. Physiological stress (swimming for 3 to 6 hours) markedly increased the permeability of the HHB of the thyroid, adrenals, and hypophysis, the change being most pronounced in the adrenals 3 hours after injection of the isotope. In another series of experiments, 0.25 mg/m<sup>3</sup> of formaldehyde was found to increase the permeability of the HHB of the thyroid, adrenals, spleen, and liver, but had no effect on that of the testes, hypophysis, and brain. Concentrations of 0.5 and especially, 1 mg/m<sup>3</sup> decreased the permeability of the HHB of the kidneys, liver, spleen, endocrine glands, adrenals, hypophysis, testes, and brain. Although the lowest concentration (0.25 mg/m<sup>3</sup>) altered the

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USSR

YUDINA, T. V., Gigiyena i Sanitariya, No 8, Aug 70, pp 75-78

permeability of the HHB of major organs and glands, it had no effect on such biochemical indices as total blood proteins, oxidase and transaminase activity and sulphhydryl groups. The increased permeability of the HHB appears to be the first link in the functional changes that take place under the influence of low-intensity factors.

2/2

1/2 019 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--EFFECT OF URANIUM ON PHOSPHATASE ACTIVITY -U-  
AUTHOR--YUDINA, T.V.  
COUNTRY OF INFO--USSR  
SOURCE--FARMAKOL. TOKSIKOL. (MOSCOW) 1970, 33(2), 230-1  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--PHOSPHATASE, ENZYME ACTIVITY, URANIUM COMPOUND, BLOOD SERUM,  
LIVER, KIDNEY, SPLEEN  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3004/0663 STEP NO--UR/C39C/70/033/C02/0230/0231  
CIRC ACCESSION NO--APC131268  
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--20NDV70

2/2 019

CIRC ACCESSION NO--AP0131268

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BEFORE ANY SYMPTOMS OF U  
POISONING, SALTS OF UIV1), GIVEN TO RATS AND RABBITS OVER PERIODS UP TO  
11 MONTHS, IN AQ. SOLN. AT 1-2 G-KG, INCREASED ACTIVITY OF ALK.  
PHOSPHATASE IN BLOOD SERUM BUT NOT LIVER, KIDNEYS OR SPLEEN. THE  
ACTIVITY OF ACID PHOSPHATASE DECREASED ONLY IN RABBIT SPLEEN.  
FACILITY: MOSK. NAUCH.-ISSLED. INST. GIG. IM. ERISAMANA, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 612.388-064.612.014.46

YUDINA, T. V., and NOVIKOV, Yu. V., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman

"Change in the Permeability of Histoematic Barriers Under the Influence of Chemical Environmental Factors"

Moscow, Gigiyena i Sanitariya, No 11, Nov 71, pp 14-18

Abstract: A study was made of the permeability of histoematic barriers in the homeostatic organs and endocrine glands under the influence of carbon tetrachloride administered over a 7-month period and of the pesticides chlorophos and zineb administered over a 6-month period. The radioactive tracer method was used. Stress was created by uninterrupted swimming for 3 hours. The relative ratio of radioactivity ( $P^{32}$  and  $S^{35}$ ) in the tissue to radioactivity in the blood served as the permeability index. The first experiment was conducted with 35 male white rats, divided into three groups, each of which received graduated doses of  $CCl_4$  administered parenterally and by inhalation, and a 4th control group; half the animals were subjected to stress. The experiment showed that stress altered permeability of the histoematic barrier in all groups. The greatest change was observed in the adrenals, where increased permeability indicates greater hormonal activity. The control groups

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YUDINA, T. V., and NOVIKOV, Yu. V., Gigiyena i Sanitariya, No 11, Nov 71, pp 14-18

showed the greatest increases. The groups not subjected to stress showed no altered permeability under the influence of  $CCl_4$ . Another study was made of the effects of chlorophos and zineb on the distribution of  $S^{35}$  in organs and tissues. Doses of 1/5000, 1/500, and 1/50  $LD_{50}$  were administered to 42 male white rats divided into nine groups and subjected to stress. The greatest permeability was observed in the kidneys, the least in the brain. The first and second groups showed increased permeability in the secretory glands; the third group, decreased permeability in the endocrine glands. Permeability is thought to depend on the level of hormonal activity. Zineb lowers permeability in organs and endocrine glands. Combined doses of chlorophos and zineb resulted in decreased permeability in proportion to increased dosage, which is related to diminished hormonal activity.

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YUDINA, V.A.

VII-10. GROWTH OF PURE LAYERS OF GALLIUM ARSENIDE

(Article by K. V. Mal'pukin, V. A. Yudina, K. D. Vlasovskaya, Novosibirsk; Izvestiya Akademiya Nauk SSSR, Seriya Fiziko-Matematicheskie Nauki, 1972, No. 1, p. 121)

The gas transport reaction method was used in the gallium-arsenic-trichloride-hydrogen system to grow pure epitaxial layers of gallium arsenide 10-20 microns thick with a mobility at 77° K to  $1.5 \cdot 10^5$  cm<sup>2</sup>/v-sec and an electron concentration of  $5.6 \cdot 10^{15}$  cm<sup>-3</sup>. Highly pure gallium and arsenic trichloride were used to synthesize the films. The films were grown on substrates of semi-insulated gallium arsenide with disorientation of 5 to 10 degrees from the (100) plane to the (111) plane, and they had a mirror smooth surface. From measurements of the Hall effect and the mobility by the Van der Pauw method in the temperature range of 20° K to 300° K, the donor and acceptor concentrations corresponded to the experimental curve for the mobility as a function of temperature and the temperature curve of the electron mobility in the temperature range of 150° K to 300° K indicates the purity of the layers and the low level of structural disturbances in the grown layers of gallium arsenide.

USSR

UDC: 537.74

GRUZDEV, S. V., DUBOVOY, N. D., KARPOV, R. G., MATYUKHIN, Yu. D.,  
OSOEN, V. I., and YUDINA, V. P.

"UHF Power Meter With Automatic Selection of the Measurement  
Limit"

Leningrad, Priborostroveniya, No 1, 1972, pp 13-17

Abstract: Most UHF power meters of the self-balancing type, in which some of the measuring operations are automatic, have a manually operated method of setting the measurement limit. The authors, members of the Ryazan Radio Engineering Institute, have devised a method of automating that adjustment as well. Where the measurements are based on the method of replacing the UHF power by the varying frequency pulse power, and especially in digital readout instruments, this can be done fairly easily, as the authors demonstrate. A block diagram of the device is given together with an explanation of its operation. The essence of the system is a wide-frequency converter for representing the output information in frequency form.

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1/2 017 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--RECOVERY OF ALCOHOL VAPORS BY ACTIVATED CARBON -U-  
AUTHOR--YUDINTSEVA, I.V.  
COUNTRY OF INFO--USSR  
SOURCE--FERMENT. SPIRIT. PROM. 1970, 36(1), 31-2  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--ETHYL ALCOHOL, ACTIVATED CARBON ADSORPTION, FOOD TECHNOLOGY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1986/1711 STEP NO--UP/0071/70/036/001/0031/0032  
CIRC ACCESSION NO--AP0103477  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0103477

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LOSSES OF ETHN INTO THE ATM. FROM PECTIN AND CONFECTIONERY PRODUCTION, ARE RATHER HIGH. A SMALL UNIT IS DESCRIBED, WHICH USES ACTIVATED C. THE ETHN IS ADSORBED FROM A STREAM OF WASTE GAS DURING 3 HR; STEAM DESORPTION REQUIRES 1.5-2 HR. VAPORS PASSING OVER THE C FOR ADSORPTION SHOULD BE SMALLER THAN OR EQUAL TO 15-20DEGREES. THE ACTIVATED C MUST BE REPLACED COMPLETELY EVERY 5-7 YEARS.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--UPTAKE OF STRONTIUM 90 AND CESIUM 137 INTO PLANTS IN RELATION TO  
THE RADICELLMENT ADSORPTION BY MECHANICAL FRACTIONS OF SOILS -U-  
AUTHOR--(03)--YUDINTSEVA, YE.V., GULYAKIN, I.V., FOLOMKINA, Z.M.  
COUNTRY OF INFO--USSR  
SOURCE--AGROKHIMIYA 1970, (2), 30-9 (RUSS)  
DATE PUBLISHED--70  
SUBJECT AREAS--AGRICULTURE, EARTH SCIENCES AND OCEANOGRAPHY  
TOPIC TAGS--SOIL CHEMISTRY, STRONTIUM ISOTOPE, CESIUM ISOTOPE, ADSORPTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PRUZY REEL/FRAHE--3002/0498 STEP NO--UR/0485/70/000/002/0030/0039  
CIRC ACCESSION NO--AP0128067  
UNCLASSIFIED

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CIRC ACCESSION NO--AP0128067

ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT. PRIME90 SR IS ADSORBED BY ORG. AND INORG. SOIL FRACTIONS, AND THE STRENGTH IS DETD. BY THE NATURE OF THE MINERAL CONSTITUENTS. PRIME137 CS IS MAINLY ADSORBED BY THE MINERAL FRACTIONS. THERE EXISTS A CLOSE CORRELATION BETWEEN THE PRIME90 SR QUANTITY DESCRIBED BY 0.1N CACL SUB2 AND ITS ACCUMULATION IN THE CROP. BOTH NUCLIDES ARE HELD BY THE SILT FRACTION OF CHERNOZEM STRONGER THAN BY THAT OF SOD PODZOLS, WHICH HAS ITS BASE IN THEIR DIFFERENT MINERALOG. COMPN. FACILITY: BIOFIZ. LAB., VSES. NAUCH. -ISSLED. INST. FITOPATOL., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC: 621.385.001.5

ZYKOVA, Ye. G., KUCHERENKO, Ye. T., YUDINSKAYA, I. V.

"Operation of Pressed Cathodes in Helium-Neon Lasers"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 2(8), 1972,  
pp 115-117

Abstract: The operation of pressed cathodes based on barium scandate and refractory metal was studied in OKG-11 helium-neon lasers. A comprehensive investigation was made of the variation in gas composition, electron temperature in the discharge plasma, and cathode emission during the service life of the device. It is shown that conditions for laser emission remain unchanged over a period of 1600 hours of operation. In this connection, the cathode can operate at a temperature approximately 100°C lower than what is considered nominal under vacuum conditions (1070°C [brightness temperature]). Two illustrations bibliography of six titles.

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USSR

UDC 576.851.49(SHIGELLA).07.21

MIKHAYLOV, I. F., and YUDITSKAYA, N. M., Central Scientific Research Institute of Epidemiology, Ministry of Health USSR, Moscow

"Invasion Suppression of Virulent Strains of *Shigella flexneri* by Avirulent Strains"

Moscow, Zhurnal Mikrobiologii Epidemiologii i Immunobiologii, No 11, 1972, pp 54-57

Abstract: Infection of guinea pigs (eyes) with virulent and avirulent strains 1605, 1195 and 1605 3R, 1195 R<sub>1</sub>, respectively) in a concentration of 10<sup>8</sup> microbial cells did not result in eye infection. The invasion of virulent cells was suppressed by avirulent cells. Higher doses of virulent strains mixed with avirulent did not result in invasion suppression. Microscopic examination of corneal epithelium revealed the presence of bacteria when only virulent cells were used, no infection when virulent and avirulent strains were used (1:), and only individual bacteria in the epithelium when the ratio of virulent and avirulent strains was 10:1. Experiments to explain the suppression mechanism of avirulent cells were unsuccessful but it was clearly established that it did not depend on the antagonistic interrelations between both strains. Further studies are needed to discover the suppression mechanism of avirulent strains.

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UDC 519.2

USSR

YUDITSKAYA, P. I.

"Asymptotic Inequalities for the Maxima of Nondifferentiable Normal Fields"

Teoriya veroyatnostey i mat. stat. Mezhd. nauch. sb. (Probability Theory and Mathematical Statistics. Interdepartmental Scientific Collection), 1972, vyp. 6, pp 133-141 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V85)

Translation: A study was made of a uniform gaussian active random field

$\xi(t)$ ,  $t \in R^n$ ,  $M\xi(t) = 0$ ,  $D\xi(t) = 1$  with the correlation function  $r(t)$ . If for small  $|t_1|, \dots, |t_n|$

$$1 - r(t) > C \sum_{m_1 + \dots + m_n = 1} \prod_{i=1}^n |t_i|^{\alpha_i m_i}$$

(the number of terms in the sum is finite,  $0 < \alpha_i \leq 2$ ,  $m_i \geq 0$ ), then almost certainly for  $\xi(t)$  the Lipschitz condition  $(C, \sigma_1/2, \dots, \sigma_n/2)$ ,  $\sigma_i < \alpha_i$ ,  $i = 1, \dots, n$  is satisfied, and for any  $\varepsilon > 0$  for large  $k$  it is almost certain that

$$\max_{t \in D_k} \xi(t) \leq \sqrt{2 \ln v(D_k)} + \frac{(1/2 + \sum_{i=1}^n 1/\alpha_i + \varepsilon) \ln \ln v(D_k)}{\sqrt{2 \ln v(D_k)}}$$

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YUDITSKAYA, P. I., Teoriya veroyatnostey i mat. stat. Mezhd. nauch. sb., 1972, vyp. 6, pp 133-141

If  $\sup_{|t| \geq 1} |\overline{r(t)}| = \delta < 1$  and one of the conditions  $\lim_{t_i \rightarrow \infty} (t_1, \dots, t_n)^\beta |r(t)| < C$   $i = 1, \dots, n$  for some  $\beta > 0$  or  $\int_{-\infty}^{\infty} \dots \int_{-\infty}^{\infty} r^2(t) dt_1 \dots dt_n < \infty$  is satisfied, then for any  $\epsilon > 0$  for large  $k$  the following is almost certain

$$\max_{t \in D_k} \overline{\xi(t)} \geq \sqrt{2 \ln v(D_k)} - \frac{(1/2 + \epsilon) \ln \ln v(D_k)}{\sqrt{2 \ln v(D_k)}}$$

( $v_1$  is the Lebesgue measure in  $R^n$ ,  $D_k$  is the domain obtained by a similar transformation of the measurable closed convex domain  $D_1$  with the similarity coefficient  $k$ ).